

102. (New) A handheld remote control apparatus, comprising:
a rotatable member being rotatable about an axis;
a sensor configured to send data associated with a rotation of the rotatable member to an electronic device, the electronic device having a plurality of selectively actuated functions; and
an actuator configured to output a haptic force sensation to said rotatable member, said actuator being configured to associate the haptic force sensation with the selected one of the plurality of functions;
a processor configured to associated force detents having varied rotary spacing with said rotatable member by controlling said actuator, said associated rotary spacing being associated with the selected one of the plurality of functions.--

Remarks

Reconsideration of this Application is respectfully requested. Upon entry of the foregoing amendment, claims 15, 17, 18, 36-48 and 75-91, 98, and 100-102 are pending in the application, with claims 15, 75, 88, 101 and 102 being the independent claims. The claims stand rejected under 35 U.S.C. 103(a).

Claim Rejections Under 35 U.S.C. 103(a)

Claims 15, 17, 18, 48, 75-77, 86, 88, 91, 92 and 100 were rejected under 35 U.S.C. 103(a) as being unpatentable over U.S. Patent No. 5,643,087 to Marcus et al. ("the Marcus Patent") in view of U.S. Patent No. 5,912,661 to Siddiqui ("the Siddiqui patent") and/or U.S. Patent No. 5,724,106 to Autry et al. ("the Autry patent"). The rejection of claim 92 is rendered moot because of the cancellation of that claim. Applicants respectfully traverse the rejection with respect to the remaining claims for the reasons set forth below.

Independent Claim 15 and its Dependent Claims

The invention recited in independent claim 15 includes an apparatus including a sensor “configured to send data associated with a rotation of [a] rotatable member to at least one electronic device” where “each of [a plurality of] selectively actuated functions [of the electronic device are] selectable based on a displacement of said rotatable member.”

The Marcus patent discloses an input device that includes a user-manipulated controller that is capable of receiving force-feedback based on particular game scenarios (e.g., depending on the type of plane used in a flight simulator). The user-manipulated control of the device in the Marcus patent is not used to select a particular function as presently claimed.

The Siddiqui patent discloses a mouse that includes a user-manipulated roller to scroll through a graphical display. While the roller may be depressed, the Siddiqui patent fails to suggest that depression of the roller causes the selection of any particular function as recited in claim 15.

The Marcus patent and the Siddiqui patent fail to disclose “selectively actuated functions being selectable based on a displacement of [a] rotatable member” as recited in claim 15. For at least this reason, the cited references, either alone or in combination, fail to disclose or suggest each and every element of the claimed invention. Accordingly, independent claim 15 is allowable over the cited references. At least based on their dependence upon independent claim 15, dependent claims 17, 18 and 48 are also allowable.

Independent Claim 75 and its Dependent Claims

The invention recited in independent claim 75 includes “sensing a displacement of the rotatable member to select the one of the plurality of functions.” As discussed above with

respect to independent claim 15, both the Marcus patent and the Siddiqui patent fail to disclose or suggest “sensing a displacement of [a] rotatable member to select the one of the plurality of functions” as recited in claim 75. For at least this reason, the cited references, either alone or in combination, fail to disclose each and every element of the claimed invention. Accordingly, independent claim 75 is allowable over the cited references. At least based on their dependence upon independent claim 75, dependent claims 76, 77 and 86 are also allowable.

• Independent Claim 88 and its Dependent Claims

Applicants have amended claim 88 to include the allowable subject matter of claim 95, including the subject matter of intervening claim 94. For at least this reason, independent claim 88 is allowable. At least based upon their dependence upon independent claim 88, claims 91, 92 and 100 are also allowable.

Dependent Claims 36, 37, 78, 79, 93, 94 and 96

Claims 36, 37, 78, 79, 93, 94 and 96 were rejected under 35 U.S.C. 103(a) as being unpatentable over the Marcus patent in view of the Siddiqui patent, and further in view of the Autry patent. The rejection of claims 93, 94 and 96 is rendered moot because of the cancellation of those claims. Based on their dependence upon independent claims 15, and 75, which are allowable for the reasons set forth above with respect to the rejection under 35 U.S.C. 103(a), dependent claims 36, 37, 78 and 79 are also allowable.

Dependent Claims 89 and 90

Claims 89 and 90 were rejected under 35 U.S.C. 103(a) as being unpatentable over the Marcus patent in view of the Siddiqui patent, and further in view of the PCT Publication WO 00/03319 to Warren. Based on their dependence upon independent claim 88, which is allowable for the reasons set forth above with respect to the rejection under 35 U.S.C. 103(a), dependent claims 89 and 90 are also allowable.

Allowable Subject Matter

Applicants appreciate the Examiner's indication of allowable subject matter in claims 38-47, 80-85, 87, 95 and 97-99. Applicants have amended independent claim 88 to include the allowable subject matter of claim 95. Applicants have added new independent claim 101, which includes the allowable subject matter of claim 97, and new independent claim 102, which includes the allowable subject matter of claim 99.

Conclusion

All of the stated grounds of rejection have been properly traversed, accommodated, or rendered moot. Applicant therefore respectfully requests that the Examiner reconsider all presently outstanding rejections and that they be withdrawn. Applicants believe that a full and complete response has been made to the outstanding Office Action and, as such, the present application is in condition for allowance. If the Examiner believes, for any reason, that personal communication will expedite prosecution of this application, the Examiner is invited to telephone the undersigned at the number provided.

Prompt and favorable consideration of this Amendment is respectfully requested.

Respectfully submitted,

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Enclosure: Appendix indicating amendments to the claims

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Claim Amendments

15. (Amended) An apparatus, comprising:

~~15. — A handheld remote control device for adjusting a plurality of functions on at least one electronic device located remotely from said remote control device, said remote control device adjusting its tactile feel in accordance with a selected one of said plurality of functions selected by said user, the remote control device comprising:~~

~~a rotatable member shaped approximately like a wheel or knob, said rotatable member rotatably coupled to a housing of said remote control device and being rotatable about an axis, said rotatable member manipulatable by a user;~~

~~a sensor coupled to said rotatable member, said sensor sensing a rotation of said rotatable member and providing data configured to send data associated with a rotation of said rotatable member to an electronic device having a plurality of selectively actuated functions, each of the selectively actuated functions being selectable based on a displacement of said rotation to said one or more electronic devices rotatable member; and~~

~~an actuator coupled to said rotatable member, said actuator ~~outputting a computer-modulated~~ configured to output a haptic force sensation onto said rotatable member, said the haptic force sensation felt by said user; and being associated with a controller coupled to said actuator and to said sensor selected one of the plurality of functions, said controller modulating said actuator to create a force sensation upon said user that corresponds with said selected one of said functions.~~

~~17. (Amended) — A handheld remote control device as recited in The apparatus of claim 15, wherein said remote control device sends signal sensor is configured to said at least one send the data to the electronic device using via wireless transmission of information using an electromagnetic beam.~~

~~18. (Amended) — A handheld remote control device as recited in The apparatus of claim 15, wherein said at least one the electronic device includes a video game console and wherein said remote control device the apparatus includes a game controller for inputting sending signals data to said the video game console.~~

36. (Amended) ~~A handheld remote control device as recited in~~ The apparatus of claim 1515, wherein ~~said~~the plurality of functions ~~include~~includes at least one of controlling a volume for audio output, selecting at least one of a received broadcast station ~~or~~and a channel from multiple stations ~~or~~and channels, and scrolling through a list of possible selections.

37. (Amended) ~~A handheld remote control device as recited in~~ The apparatus of claim 3636, wherein ~~said~~the haptic force sensation ~~corresponding~~associated with controlling ~~said~~the volume for audio output includes at least one of a damping ~~or~~sensation and a friction sensation.

38. (Amended) ~~A handheld remote control device as recited in~~ The apparatus of claim 3636, wherein ~~said~~the haptic force sensation ~~corresponding~~associated with selecting ~~said~~at least one of the broadcast station ~~or~~and the channel includes at least one of a detent ~~or~~sensation and a jolt sensation.

39. (Amended) ~~A handheld remote control as recited in~~ The apparatus of claim 3838, wherein ~~detents or jolts of said~~the detent ~~or~~sensation and the jolt sensation are ~~spaced to~~correspondassociated with a selection of particular stations ~~or~~and channels.

40. (Amended) ~~A handheld remote control device as recited in~~ The apparatus of claim 3636, wherein ~~said~~the haptic force sensation ~~corresponding~~associated with scrolling through a list of possible selections includes a spring return sensation.

41. (Amended) ~~A handheld remote control device as recited in~~ The apparatus of claim 4040, wherein ~~said~~the scrolling is ~~achieved~~associated ~~through~~with an isometric control paradigm.

42. (Amended) ~~A handheld remote control device as recited in~~ The apparatus of claim 1515, wherein ~~said controller can provide both~~the actuator is configured to be responsive to isometric and isotonic interface paradigms ~~to said user~~.

43. (Amended) ~~A handheld remote control device as recited in~~ The apparatus of claim
~~15 wherein said 15, further comprising a controller assigns, the controller configured to assign at~~
~~least one of a plurality of different levels of simulated inertia to said rotatable member, said the~~
~~assigned level of inertial based upon said the selected function one of the plurality of selectively~~
~~actuated functions.~~

44. (Amended) ~~A handheld remote control device as recited in~~ The apparatus of claim
~~15 wherein said 15, further comprising a controller assigns detents with varying rotary spacing,~~
~~the controller configured to selectively associate detents from a plurality of detents with said~~
~~rotatable member, said assigned rotary spacing based upon said the selectively associated detents~~
~~being associated with the selected function one of the plurality of selectively actuated functions.~~

45. (Amended) ~~A handheld remote control device as recited in~~ The apparatus of claim
~~15 wherein said 15, further comprising a controller assigns, the controller configured to associate~~
~~hard stops at different predetermined locations within a range of travel of said rotatable member,~~
~~said assigned location based upon said the predetermined locations being associated with the~~
~~selected function one of the plurality of selectively actuated functions.~~

46. (Amended) ~~A handheld remote control device as recited in~~ The apparatus of claim
~~15 wherein said 15, further comprising a controller assigns, the controller configured to associate~~
~~different levels of simulated damping to with said rotatable member, said the assigned associated~~
~~level of simulated damping based upon said being associated with the selected function one of the~~
~~plurality of selectively actuated functions.~~

47. (Amended) ~~A handheld remote control device as recited in~~ The apparatus of claim
~~15 wherein said 15, further comprising a controller assigns, the controller configured to associate~~
~~different levels of simulated friction to said rotatable member, said the assigned associated level~~
~~of simulated friction based upon said being associated with the selected function one of the~~
~~plurality of selectively actuated functions.~~

48. (Amended) ~~A handheld remote control device as recited in~~ The apparatus of claim 1515, wherein the displacement of said rotatable member can be depressed by said user, wherein depressing is a depression of said rotatable member causes said selection to be made.

75. (Amended) A method ~~for providing a handheld remote control device for manipulating a plurality of functions on at least one electronic device located remotely from said remote control device, said remote control device adjusting its tactile feel in accordance with a selected one of said plurality of functions selected by said user, the method comprising:~~

~~enabling a sensing of a position of a rotatable member shaped approximately like a wheel or knob, said~~ of an apparatus, the rotatable member rotatably coupled to a housing of said remote control device and being rotatable about an axis, and sending an indication of said the apparatus configured to send a position signal to said at least one electronic device, said the position signal associated with the position of the rotatable member manipulatable by a user;

~~enabling an application of a computer modulated~~ outputting a haptic force sensation onto said the rotatable member about said axis using via an actuator coupled to said the rotatable member, said user feeling said the haptic force sensation, wherein said force sensation corresponds associated with said a selected one of said a plurality of functions associated with the electronic device; and

sensing a displacement of the rotatable member to select the one of the plurality of functions.

76. (Amended) ~~A~~ The method as recited in of claim 75 wherein 75, further comprising: modulating the haptic force sensation via a controller coupled to said the actuator and to said the sensor modulates said actuator to create said force sensation upon said user that corresponds with said selected one of said functions.

77. (Amended) ~~A~~ The method as recited in of claim 75 75, wherein said sending of said indication of said the apparatus is configured to transmit the position to said at least one electronic device using signal via wireless transmission of information using an electromagnetic beam.

78. (Amended) ~~A~~ The method as recited in ~~claim 7575~~, wherein ~~said~~ the outputting the haptic force sensation associated with a selected one of the plurality of functions include includes outputting the haptic force sensation associated with at least one of controlling a volume for audio output, selecting at least one of a received broadcast station ~~or~~ and a channel from multiple stations ~~or~~ and channels, and scrolling through a list of selections.

79. (Amended) ~~A~~ The method as recited in ~~claim 7878~~, wherein ~~said~~ the outputting the haptic force sensation eorrespondingassociated with selecting ~~said~~ at least one of the broadcast station ~~or~~ and the channel includes outputting at least one of a detent ~~or~~ and a jolt sensation, ~~wherein~~ the detents or jolts of said decent or associated with the detent sensation and the jolt sensation are being spaced configured to eorrespondbe associated with a selection of particular stations or channels.

80. (Amended) ~~A~~ The method as recited in ~~claim 7878~~, wherein ~~said~~ the outputting the haptic force sensation eorrespondingassociated with scrolling through a list of selections includes outputting a spring return sensation.

81. (Amended) ~~A~~ The method as recited in ~~claim 8080~~, wherein ~~said~~ scrollingthe outputting a spring return sensation is achievedassociated throughwith an isometric control paradigm.

82. (Amended) ~~A~~ The method as recited in ~~claim 7575~~, further comprising enabling:

selecting a mode selection, said mode selection indicatingfrom one of an isotonic mode ~~or~~ and an isometric mode ~~for~~ of ~~said~~ the rotatable member, ~~wherein~~ the saidhaptic force sensation appliedoutput to ~~said~~ the rotatable member isbeing different depending on ~~said~~ the selected mode.

83. (Amended) ~~A~~ The method as recited in ~~claim 7575~~, further comprising ~~enabling~~ the assigning of:

~~associating detents with varying~~varied rotary spacing to ~~said~~the rotatable member, ~~said~~
~~assigned rotary spacing based upon said~~the associated detents being associated with the selected
~~function~~one of the plurality of functions.

84. (Amended) ~~A~~ The method as ~~recited in~~of claim 7575, further comprising ~~enabling~~
~~the assigning of~~:

associating hard stops at different locations within a range of travel of ~~said~~the rotatable
member, ~~said assigned location based upon said~~the locations associated with the selected
~~function~~one of the plurality of functions.

85. (Amended) ~~A~~ The method as ~~recited in~~of claim 7575, further comprising ~~enabling~~
~~the assigning of~~

associating different levels of simulated damping to ~~said~~the rotatable member, ~~said~~the
~~assigned~~associated level of simulated damping ~~based upon said~~associated with the selected
~~function~~one of the plurality of functions.

86. (Amended) ~~A~~ The method as ~~recited in~~of claim 7575, wherein ~~said~~sensing
displacement of the rotatable member can be depressed by ~~said~~ user, wherein depressing
~~said~~includes sensing a depression of the rotatable member causes ~~said~~ selection to be made.

87. (Amended) ~~A~~ The method as ~~recited in~~of claim 7575, wherein ~~said~~the haptic
force sensation is ~~coordinated~~associated with an event occurring in a graphical environment
implemented by ~~said~~the at least one electronic device, ~~wherein said event is a scrolling of a~~
~~displayed document as controlled by said sensed rotation of said rotatable member~~.

88. (Amended) ~~A handheld remote control device for interfacing a user's input with an~~
~~electronic device and providing haptic feedback~~apparatus, ~~said handheld remote control device~~
~~manipulating a plurality of functions on said electronic device and adjusting its tactile feel in~~
~~accordance with a selected one of said plurality of functions selected by said user, the remote~~
~~control device comprising:~~

~~a rotatable member shaped approximately like a wheel or knob, said rotatable member rotatably coupled to a housing of said remote control device and being rotatable about an axis, said rotatable member manipulatable by a user;~~

~~a sensor sensing configured to send data associated with a rotation of said rotatable member and providing data based on said rotation of the rotatable member to said an electronic device having a plurality of selectively actuated functions, at least one of the selectively actuated functions includes selecting at least one of a broadcast station and a channel from multiple stations and channels; and~~

~~an actuator outputting a computer modulated force sensation on said rotatable member, said force sensation felt by said user; and~~

~~a processor in communication with said actuator, said processor controlling said actuator to create configured to output a haptic force sensation upon to said user that corresponds rotatable member, said actuator being configured to associate the haptic force sensation with said the selected one of said the plurality of functions, the haptic force sensation including at least one of a detent and a jolt, the at least one of the detent and the jolt being spaced apart in the rotation of the rotatable member, the at least one of the detent and the jolt being associated with the selection of the at least one of the broadcast station and the channel.~~

89. (Amended) ~~A handheld remote control device as recited in~~ The apparatus of claim 8888, wherein said actuator is a passive actuator.

90. (Amended) ~~A handheld remote control device as recited in~~ The apparatus of claim 8888, wherein said actuator is an active actuator.

91. (Amended) ~~A handheld remote control device as recited in~~ The apparatus of claim 8888, wherein ~~said providing the sensor is configured to provide the data to said the~~ the electronic device uses via wireless transmission ~~of information using an electromagnetic beam.~~

98. (Amended) ~~—A handheld remote control device as recited in claim 88 wherein~~ The apparatus of claim 88, further comprising a processor configured to communicate with the

actuator and configured to associate the haptic force sensation with the selected one of the plurality of functions, said processor ~~enables two~~configured to include selectable modes for said remote control device, said the selectable modes including ~~an~~ a selectable isotonic mode and ~~an~~ a selectable isometric mode for said rotatable member, wherein ~~the~~ said haptic force sensation applied output to said rotatable member ~~is~~ being different depending on which of said the modes ~~has been~~ is selected.

100. (Amended) ~~A handheld remote control device as recited in~~ The apparatus of claim 888, wherein said rotatable member ~~can~~ is configured to be depressed in said housing of said remote control device by said user, wherein depressing said rotatable member causes said selection configured to be made select the selected one of the plurality of functions based on the depression.